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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/170,835	10/13/1998	DUNMIN ZHENG	1-15	7202

22046	7590	04/20/2005	

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EXAMINER
HAROLD, JEFFEREY F

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/170,835	ZHENG ET AL.
	Examiner	Art Unit
	Jefferey F Harold	2644

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 April 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-18</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-18</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   In view of the APEAL BRIEF filed on April 9, 2003, PROSECUTION IS HEREBY

REOPENED. A new grounds for rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the

following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply

under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied

by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130,

1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   ***Claims 1 and 9*** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Kuo (United States Patent 6,418,227) in view of well know prior art (MPEP 2144.03).

Regarding **claim 1**, Kuo discloses an active noise control system and method for

on-line feedback path modeling. In addition, Kuo discloses an active noise reduction

system, wherein: the ANR system comprises a noise reference microphone and a digital filter; the digital filter is receivingly coupled to the noise reference microphone, and transmittingly coupled to a receiver transducing element in the handset; the ANR system ANR system is configured as a fixed feed-forward noise-cancellation system, however, Kuo fails to disclose a non-adaptive IIR filter. However, the examiner takes official notice of the fact that it was well know in the art to provide a non-adaptive IIR filter.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kuo by specifically providing non-adaptive IIR filter, for the purpose of providing a filter that requires fewer calculations and thus a high sample rate filter.

Regarding **claim 9**, it is interpreted and thus rejected for the reasons set forth above in the rejection of claim 1.

3.   ***Claims 2, 5-7 and 9-18*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo, in view of well known prior art, and further in view of Kimura.

Regarding **claim 2**, Kuo and well known prior art discloses everything claimed as applied above (see claim 1), however, Kuo fails to disclose wherein the noise reference microphone has a port, and the port opens through an external surface of the handset that, in use, does not directly face the user's ear. However, the examiner maintains that it was well known in the art to provide wherein the noise reference microphone has a

port, and the port opens through an external surface of the handset that, in use, does not directly face the user's ear, as taught by Kimura.

In addition, Kimura discloses wherein the noise reference microphone has a port, and the port opens through an external surface of the handset that, in use, does not directly face the user's ear, as disclosed at column 7, lines 42-52 and exhibited in figure 9.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing wherein the noise reference microphone has a port, and the port opens through an external surface of the handset that, in use, does not directly face the user's ear, as taught by Kimura, for the purpose of obtaining a sample of the noise environment.

Regarding **claim 5**, Kuo and well known prior art discloses everything claimed as applied above (see claim 1), however, the combination fails to disclose wherein the noise reducing device has an operating frequency range; the receiver transducing element has an approximate transfer function $Y(w)$; when the handset is in use, a transfer function $F(w)$ approximately relates ambient noise pressure n_2 at a user's ear-canal opening to ambient acoustic noise pressure $n1$ at the port of the noise reference microphone according to $n_2=F(w)n_1$; and over the operating range, the IIR filter has a transfer function given by the product of weighting function times $F(w)/Y(w)$. However, the examiner maintains that it was well known in the art to provide wherein the noise reducing device has an operating frequency range; the receiver transducing element has an approximate transfer function $Y(w)$; when the handset is in use, a transfer

function F(w) approximately relates ambient noise pressure n_2 at a user's ear-canal opening to ambient acoustic noise pressure n1 at the port of the noise reference microphone according to $n_2=F(w)n_1$; and over the operating range, the IIR filter has a transfer function given by the product of weighting function times $F(w)/Y(w)$, as taught by Kimura.

In addition, Kimura discloses wherein the noise reducing device has a operating frequency range of up to 1.5kHz, as disclosed at column 6, lines 14-28 and exhibited in figure 6,

the speaker unit (84) has a approximate transfer function F, as disclosed at column 8, lines 13-18,

when the handset is in use, a transfer function P relates noise pressure at the user's ear to the ambient noise and the reference microphone, as disclosed at column 8, line 13 through column 9, line 63,

over the operating range the transfer means (15) and sound producing means (5) has a transfer function that can be derived as F/P.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically wherein the noise reducing device has an operating frequency range; the receiver transducing element has an approximate transfer function Y (w); when the handset is in use, a transfer function F(w) approximately relates ambient noise pressure n_2 at a user's ear-canal opening to ambient acoustic noise pressure n1 at the port of the noise reference microphone according to $n_2=F(w)n_1$; and over the operating range, the IIR filter has a

transfer function given by the product of weighting function times F(w)/Y(w), as taught by Kimura, for the purpose of canceling the noise signal.

Regarding **claim 6**, Kuo, well known prior art and Kimura discloses everything claimed as applied above (see claim 5), however, the combination fails to disclose wherein the weighting function rolls off above the operating frequency. However, the examiner maintains that it was well known in the art to provide wherein the weighting function rolls off above the operating frequency, as taught by Kimura.

In addition, Kimura discloses wherein the weighting function (F/P) rolls off above 1.5kHz as exhibited in figure 4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination by specifically providing wherein the weighting function rolls off above the operating frequency, as taught by Kimura, for the purpose of canceling the noise signal.

Regarding **claim 7**, Kuo, well known prior art and Kimura discloses everything claimed as applied above (see claim 5), however, the combination fails to disclose wherein G(w) is a feasible open loop gain for the ANR system if it is configured as a fixed feed back system instead of a fixed feed-forward system; and over the operating range, the weighting function is G(w)/(1+G(w)). However, the examiner maintains that it was well known in the art to provide wherein G(w) is a feasible open loop gain for the ANR system if it is configured as a fixed feed back system instead of a fixed feed-forward system; and over the operating range, the weighting function is G(w)/(1+G(w)), as taught by Kimura.

In addition, Kimura discloses wherein G is a feasible open loop gain for the noise

reduction device if it is configured as a fixed feedback system instead of a feed-forward

system: and over the operating rage, the weighting function is G/(1+G)

Wherein P is the output, F is the transfer function, N is the ambient noise, and G is the

gain, hence:

P=Ge

e=(N-F)

e=N-(P*A(w))

P=G(N-(P*A(w))

P=GN – GPA(w)

P(1+GA(w))=GN

P=GN/(1+GA(w))

If A(w) =1, then P/N = G/(1+G).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify the combination by specifically providing wherein

G(w) is a feasible open loop gain for the ANR system if it is configured as a fixed feed

back system instead of a fixed feed-forward system; and over the operating range, the

weighting function is G(w)/(1+G(w)), as taught by Kimura, for the purpose of canceling

the noise signal.

Regarding **claims 9-18**, they are interpreted and thus rejected for the reasons

set forth above in the rejection of claims 1, 2 and 5-7. Since claims 9-18 disclose a

method that corresponds to the apparatus disclosed in claims 1, 2 and 5-7 above, they

provide an inherent process for the implementation of the apparatus claims. Therefore

they are interpreted and thus rejected for the reasons set forth above in the rejection of

claims 1, 2 and 5-7.

4.   ***Claims 3-4 and 8*** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Kuo, in view of well known prior art, further in view of Kimura and further in view of

well know prior art.

Regarding **claims 3 and 4**, Kuo, well known prior art and Kimura, the

combination discloses everything claimed as applied above (see claim 2), however, the

combination fails to disclose minimal distances between the reference microphone and

the speaker. However, the examiner takes official notice of the fact that is was well

know in the art to provide minimal distances between the reference microphone and the

speaker.

Therefore, it would have been obvious to one of ordinary skill n the art at the time

the invention was made to modify the combination by specifically providing minimal

distance between the reference microphone ant eh speaker, for the purpose of

providing the best noise sample for the noise reduction device with the minimal

feedback between the microphone and the speaker.

Regarding **claim 8**, Kuo, well known prior art and Kimura, the combination

discloses everything claimed as applied above (see claim 5), however, the combination

fails to disclose averaging over a population of users. However, the examiner takes

official notice of the fact that is was well know in the art to provide averaging over a population of users.

Therefore, it would have been obvious to one of ordinary skill n the art at the time the invention was made to modify the combination by specifically providing averaging over a population of users, for the purpose of determining the characteristics of the non-adaptive filter.

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jefferey F Harold whose telephone number is 571-272-7519. The examiner can normally be reached on Monday - Friday 9 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jefferey F Harold
Examiner
Art Unit 2644

JFH
April 14, 2005